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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,223	11/26/2001	Kenichi Kurisu	50395-125	6863

7590 12/24/2003  
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EXAMINER

VINH, LAN

ART UNIT PAPER NUMBER

1765

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/993,223

**Applicant(s)**

KURISU, KENICHI

**Examiner**

Lan Vinh

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/993223.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443)

Narui discloses a method for forming a light emitting device/optical element having a layer that makes diffraction grating (col 2, lines 31-34). This method comprises the step of etching a pattern in a ZnSe layer 10 by RIE method using a gas of boron trichloride (BCl<sub>3</sub>) (col 5, lines 55-56; col 6, lines 26-28), which reads on RIE a pattern in a ZnSe substrate by means of only chlorine-based gas which does not include a hydrocarbon group.

Unlike the instant claimed invention as per claim 1, Narui does not disclose that the ZnSe substrate is a polycrystalline substrate

However, Biricik, in a method of manufacturing optical semiconductor windows, teaches forming a polycrystalline ZnSe substrate (col 15, lines 33-34)

Since Narui is concerned with a method of forming an optical element, one skilled in the art would have found it obvious to modify Narui method by forming a polycrystalline ZnSe substrate as per Biricik because Biricik teaches that polycrystalline ZnSe are preferred substrates for optical transmission, durability (col 15, lines 32-34)

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The limitation of claim 4 has been discussed above.

3. Claims 2, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443)

Narui discloses a method for forming a light emitting device/optical element having a layer that makes diffraction grating (col 2, lines 31-34). This method comprises the step of etching a pattern in a ZnSe layer 10 by RIE method using a mixed gas of boron trichloride ( $\text{BCl}_3$ ) and He/helium/inert gas (col 5, lines 55-56; col 6, lines 26-28), which reads on RIE a pattern in a ZnSe substrate with a mixture of a chlorine-based gas which does not include a hydrocarbon group and inert gas

Unlike the instant claimed invention as per claim 2, Narui does not disclose that the ZnSe substrate is a polycrystalline substrate

However, Biricik, in a method of manufacturing optical semiconductor windows, teaches forming a polycrystalline ZnSe substrate (col 15, lines 33-34)

Since Narui is concerned with a method of forming an optical element, one skilled in the art would have found it obvious to modify Narui method by forming a polycrystalline ZnSe substrate as per Biricik because Biricik teaches that polycrystalline ZnSe are preferred substrates for optical transmission, durability (col 15, lines 32-34)

The limitation of claim 7 has been discussed above

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4. Claims 3, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443 ) and further in view of Collins (US 5,707,486)

Narui as modified by Biricik has been described above in paragraph 3. Narui and Biricik differ from the instant claimed invention as per claim 3 by using an inert gas of helium instead of argon.

However, Collins, in a process of plasma etching/RIE etching, teaches that an inert gas such as argon and helium can be added to the etching gas chemistry (col 18, lines 9-11)

Since Narui is concerned with a step of RIE etching, one skilled in the art would have found it obvious to substitute Narui and Biricik inert gas of helium with argon in view of Collins's teaching because both gases are known inert gases and Collins states that argon is the preferred inert gas additive, because it is relatively massive and thus contributes to the sputter etch component of the RIE process (col 17, lines 32-35)

The limitation of claim 8 has been discussed above.

5. Claims 5, 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443 ) and further in view of Harafuji (US 5,635,021)

Narui as modified by Biricik has been described above in paragraph 2. Unlike the instant claimed invention as per claims 5, 9, 10, Narui and Biricik do not specifically disclose performing the RIE etching at a gas pressure of 0.5 Pa through 1 Pa.

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However, Harafuji, in a method of dry etching using RIE, teaches setting the gas pressure of a chlorine-based gas such as  $\text{BCl}_3$  at a pressure of 0.1-20 Pa (overlaps the claimed range of 0.5-1 Pa) during RIE etching (col 38, lines 55-61)

Since both Narui and Harafuji are concerned with RIE etching step using chlorine-based gas, one skilled in the art would have found it obvious perform Narui and Biricik's RIE etching step at a pressure range as taught by Harafuji especially since Harafuji states that when other plasma internal parameters than the gas pressure are constant, the spread of the ion angular distribution can be controlled to a certain degree by changing the gas pressure of about 1 Pa (col 20, lines 64-67)

6. Claims 6, 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443 ) and further in view of Kim et al (US 6,037,267)

Narui as modified by Biricik has been described above in paragraph 2. Unlike the instant claimed invention as per claims 6, 11, 12, Narui and Biricik do not specifically disclose activating the gas by means of radio frequency (RF)

However, Kim discloses a method of etching using RIE etching comprises the step of supplying RF (radio frequency) coil power to the upper electrode to excite the species of the gas (col 4, lines 38-41), which reads on activating the gas by means of radio frequency (RF)

Since Narui is concerned with RIE etching step, one skilled in the art would have found it obvious to modify Narui and Biricik RIE etching step by activating the gas by

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means of radio frequency (RF) as per Kim because according to Kim the coil RF power also constrains the electron to orbit in a plasma region away from the chuck, the electrons of the plasma then interact with other species of the etching gas to form ions and radicals (col 4, lines 42-45)

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443) and further in view of Lee et al (US 5,776,793)

Narui as modified by Biricik has been described above in paragraph 2. Unlike the instant claimed invention as per claim 13, Narui and Biricik do not specifically disclose a step of synthesizing polycrystalline ZnSe from Zn and H<sub>2</sub>Se.

Lee discloses a method for fabricating opto-electronic device comprises the step of growing ZnSe from Zn and H<sub>2</sub>Se (col 3, lines 14-17), which reads on a step of synthesizing polycrystalline ZnSe from Zn and H<sub>2</sub>Se.

Hence, one skilled in the art would have found it obvious to modify Narui and Biricik by growing polycrystalline ZnSe from Zn and H<sub>2</sub>Se as per Lee because according to Lee growing ZnSe from Zn and H<sub>2</sub>Se provides suitable epilayer growth conditions which need neither expensive equipment nor highly technical step to obtain high quality ZnSe (see abstract)

***Response to Arguments***

8. Applicant's arguments filed 10/14/2003 have been fully considered but they are not persuasive.

Applicants argue that the examiner has not accurately stated the difference between the claimed invention and the method disclosed by Narui because the claimed invention differs from the methodology of Narui in that it is directed to a method of making DOE while Narui discloses an etching method to form the grating layer employing a mask for precision work of the crystal layer in the transverse direction. This argument is unpersuasive for two reasons. First at all, the phrase "a method of making a DOE" is the preamble of the claim and the examiner notes that "a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness, instead the process steps or structural limitations are able to stand alone (MPEP 2111.02). In addition, Narui discloses a method for forming a light emitting device/optical device comprises the etching step to form the grating layer employing a mask for precision work of the crystal layer in the transverse direction.

In response to applicant's argument that there is no suggestion/motivation to combine the references of Narui and Biricik because the requisite motivation element has not been established and the examiner has not factually establish a reason to modify the monocrystalline zinc selenide employed by Narui by employing a polycrystalline zinc selenide, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the



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claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, since the objective of Narui is a method of making a LED/optical device employing monocrystalline zinc selenide and Biricik teaches the advantage of employing polycrystalline zinc selenide for optical device, one skilled in the art would have found it obvious to modify the monocrystalline zinc selenide employed by Narui by employing a polycrystalline zinc selenide with a reasonable expectation of successfully achieving the objective of Narui. Thus, the examiner asserts that the requisite motivation element to combine Narui and Biricik has been established.

In response to applicant's argument that there is no suggestion/motivation to combine the references of Narui and Biricik because Biricik employ polycrystalline zinc selenide in a completely different application, the examiner notes that Biricik employs polycrystalline ZnSe in a method for manufacturing of optical transparent semiconductor windows/optical device which is not completely different from Narui's method of forming a LED/optical device.

The applicants argue that the examiner has not explained why that would have led one having ordinary skill in the art to modify the particular device of Narui by employing polycrystalline ZnSe. This argument is unpersuasive because in paragraph 2 above, the examiner has explained that since Narui is concerned with a method of forming an optical element, one having ordinary skill in the art would have found it obvious to

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modify Narui by employing polycrystalline ZnSe substrate because Biricik teaches that polycrystalline ZnSe are preferred substrates for optical transmission, durability

The applicants further argue that the primary reference of Narui discloses an etching method which focuses upon precision in the transverse direction, which has nothing to do with the claimed invention, which focuses upon a smooth etched surface for diffracting an external incident laser beam. This argument does not commensurate with the scope of independent claim 1 because claim 1 does not require "a smooth etched surface for diffracting an external incident laser beam".

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV

December 15, 2003